

REMARKS

Claims 1-39 are currently pending in this application.

Claims 1-39 have been rejected on various grounds. The Applicants respectfully traverse these rejections as they apply to the amended claims and request reconsideration.

Interview Summary

The Applicants thank the Examiner for holding a telephone interview with attorney Albert Metrailler on March 7, 2006. In the interview, the office action paragraph 8 was discussed with particular reference to the independent claims and the *Christopher* reference. The attorney noted that *Christopher* teaches a plurality of collections of explosive material and each collection has one initiator. As noted below in more detail, *Christopher* teaches explosive confining disks and spacers specifically provided to prevent sympathetic detonation of a second explosive as a result of detonation of a first explosive. This is quite different from the one explosively coupled collection of explosives called for in each of the independent claims. The *Regalbuto* reference has a single explosively coupled collection of explosives, but has only two initiators, one at each end, and does not have the third initiator between the first two. The Examiner indicated that she understood the distinction, in particular when the teaching of *Christopher* that the explosives should be spaced out in time to avoid interference between them is considered.

Specification

1. The Abstract was objected to for reciting certain implied phrases. By the present amendment, the Abstract has been amended and now complies with requirements.

Drawings

3. The drawings were objected to on the basis that they do not show a feature specified in the claims, in particular the spherical mass of explosive recited in claims 4 and 13-15. The Examiner's attention is directed to Fig. 6 which shows a spherical mass of explosive material 2, 4. Paragraph [0058] also confirms that Fig. 6 illustrates an "explosive material that is generally spherical in overall shape."

4. The drawings were objected to on the basis that the labels in the figures should be limited to reference characters. Replacement formal drawings are submitted with this response. As required by the Examiner, the labels are limited to reference characters.

5. The drawings were objected to on the basis that they did not contain the reference number 10. The replacement drawings include the reference number 10 in Fig. 1.

The Applicants submit that the replacement drawings overcome the objections to the drawings as filed.

Claim Objections

6. Claims 22, 38 and 39 were objected to for certain informalities.

Claims 22 and 39 were objected to because the "at least one initiator" for each region was not differentiated. These claims have been amended to recite first, second, and third initiators for the respective first, second and third regions of the explosive material.

The Examiner suggested that claim 38 should depend from claim 22 because it was not clear how the shaped charge can pre-score the tubular simultaneously with the arrival of the first and second pressure waves if the shaped-charge is initiated prior to arrival of the waves.

Claim 38 depends from claims 36, 35, 22. Claim 35 provides the shaped charge element and provides that it is initiated prior to arrival of the first or second pressure wave **at the initiation site** of the shaped charge. Claim 38 provides that the shaped charge prescores the tubular structure about simultaneously to the arrival of the first and second pressure waves **at the tubular structure**. The initiation site of the shaped charge is necessarily in the shaped charge and therefore some distance from the tubular structure. It therefore takes time for the shaped charge jet to reach the tubular structure. By initiating the shaped charge before the arrival of the first/second pressure waves at the initiation site, the jet has time to reach the tubular member at about the same time that the first/second pressure waves reach the tubular structure at the point radially outward from the shaped charge. The Applicants submit that claim 38 properly depends from claims 36, 35, 22.

As noted during the interview, the Examiner's suggestion concerning claim 38 also points out a distinction and advantage of the present invention. The *Regalbuto* reference has a collection of explosive material much like that of the present invention. However, *Regalbuto* has only two initiators, one at the top and one at the bottom. The shaped charge explosives 68, 72 are detonated by the pressure waves from the explosives above and below them. However, such a pressure wave would not detonate the explosives 68, 72 in the same way as normal shaped charges which are normally initiated near the innermost point of the liner 74. The pressure wave normally moves out from the innermost point to the outermost part of the liner and generates a jet of liquefied liner material. The pressure wave in *Regalbuto* would appear to travel at right angles to the normal shaped charge pressure wave and would appear to liquefy the liner from its outermost part to its innermost point. The present invention provides the third initiator at the center of the shaped charge so that the liner is liquefied in the preferred manner.

Claim Rejections – 35 USC § 102

Claims 1-4, 9, 12-14, 16, 17, 19-22, 24, 26, 29, 30, 32, 34, and 39 have been rejected under 35 USC § 102(b) as being anticipated by *Christopher* (U.S. Patent 3,053,182).

Regarding claim 1, the Examiner asserted that *Christopher* teaches certain elements that the Applicants submit are not shown in *Christopher* as follows.

“An explosively coupled collection of explosive material”.

Paragraph 35 of the present application defines “explosively coupled” to mean that two groups or sections of explosive material are positioned relative to each other so that explosion of one of them will cause explosion of the other. Claim 1 comprises one explosively couple collection of explosive material. *Christopher* on the other hand teaches a plurality of collections of explosive material, with each collection isolated from the others to avoid explosive coupling. *Christopher* teaches that when multiple shaped charges are detonated in close proximity at the same time, the jets may interfere with each other. At col. 6, lines 33-37, *Christopher* teaches that this can be avoided by detonating the explosive sections at different times. *Christopher* also teaches at col. 6, lines 39-44, that explosive confining disks 43 and spacing disks 44 are used to prevent sympathetic detonation from occurring. This makes it clear that the various explosive elements of *Christopher* are not explosively coupled as required by Claim 1.

“A first initiator 40 (uppermost in Fig. 1) coupled with a collection of explosive material at a first location 35”

It is true that the initiator 40 is coupled to a collection of explosive material. But it is the only initiator coupled to that particular collection.

“A second initiator 40 (middle in Fig. 1, not labeled) coupled with a collection of explosive material at a second location”

It is true that there is a second initiator, but it is coupled to a second collection of explosive material, not to the same collection as the first initiator and not to a collection that is explosively coupled to the first.

“A third initiator (Fig. 3) coupled with a collection of explosive material at a location between the first and second”

It is true that there is a third initiator, but it is coupled to a third collection of explosive material, not to the same collection as the first and second initiators and not to a collection explosively coupled to the first collection.

Since *Christopher* does not teach all of the elements of claim 1, the Applicants submit that claim 1 is patentable over *Christopher*. Since claims 2-21 depend from claim 1, Applicants submit that claims 2-21 are also patentable over *Christopher*.

Regarding claims 22, 39, the Examiner asserted that *Christopher* teaches a method for using the device of claim 1 that includes using the first two regions of explosive materials to create two pressure waves and the third region to create a pressure wave therebetween.

It is clear from the above remarks that claims 22, 39 both require a single explosively coupled collection of explosive material and that the three pressure waves must be traveling through that single collection of material. *Christopher* provides three isolated regions of explosive

material, each having its own pressure wave. *Christopher* specifically provides for isolating the three materials to prevent the pressure wave from one from causing the others to explode. As a result, the Applicants submit that claims 22, 39 are also patentable over *Christopher*. Since claims 23-38 depend from claim 22, Applicants submit that claims 23-38 are also patentable over *Christopher*.

Summary

In view of the above remarks, the Applicants submit that the claims 1-39, as amended, are now allowable and respectfully request allowance of claims 1-39.

The Commissioner is hereby authorized to charge payment of any further fees associated with any of the foregoing papers submitted herewith, or to credit any overpayment thereof, to Deposit Account No. 50-1515, Conley Rose, P.C.

If the Examiner has any questions or comments or otherwise feels it would be helpful in expediting the application, he is encouraged to telephone the undersigned at (972) 731-2288.

Respectfully submitted,
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